

**AMENDMENT UNDER 37 C.F.R. § 1.111**  
**U.S. Application No. 09/667,301**

**REMARKS**

This Amendment, submitted in response to the Office Action of May 21, 2001, is believed fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration is respectfully requested.

As a preliminary matter, minor amendments have been made to the specification to correct grammatical errors. No new matter has been added.

In addition, claim 1 has been amended, claims 2 and 3 have been cancelled without prejudice, and claims 8-16 have been added for consideration. The newly added claims all depend from independent claim 1 and are presented to define the present invention more completely.

Applicants are in receipt of the Form PTO-1449, on which the Examiner has crossed out the two foreign patent documents. Applicants request that the Examiner explain why the documents were not considered, if in fact they have not been considered by the Examiner. The first document (2000-70412) corresponds to U.S. Patent Application 09/390,290, now pending in the U.S. Patent Office. This application is also discussed on the first page of the present application. In this respect, the Examiner has sufficient information to consider the Japanese patent application. The reference to this application on the first page constitutes the concise explanation requirement.

The second foreign patent document (2,658,811) corresponds to U.S. Patent No. 5,556,098, which the Examiner has considered. Therefore, it is believed that the foreign patent document has also been considered. If the Examiner believes otherwise, he is requested to indicate why he will not or has not considered that document.

Claims 1-7 have been examined. The claims stand rejected under §103(a) as being unpatentable over Higuchi *et al.* in view of Shama. This rejection is respectfully traversed.

The present invention is directed to a solid multi-piece golf ball having a solid core, a mantle, and a cover. The ratio of the compression of the mantle to the compression of the solid



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core is at least 0.98, and the difference in JIS-C hardness between the surface and the center of the solid core is at least 5. The mantle is also made of a material composed primarily of thermoplastic resin and has a thickness of up to 1.5 mm.

Accordingly, the solid multi-piece golf ball according to the present invention includes a solid core, mantle, and a cover. The golf ball obtains good feel when hit with various types of clubs, such as a #1 wood, #9 iron and putter, and the ball has improved performance when struck with a driver. In summary, the present invention provides:

- (i) the mantle and the solid core have a compression ratio, defined as (compression of mantle)/(compression of solid core), of at least 0.98, wherein the compression is the amount of deformation when subjected to a load of 1275 N from a initial load of 98 N;
- (ii) the JIS-C hardness difference between the surface and the center of the solid core is a at least 5; and
- (iii) the mantle is made of a material composed primarily of a thermoplastic resin and has a thickness of up to 1.5 mm.

The prior art rejection of the claims is respectfully traversed for the following reasons.

Higuchi *et al.* teaches a three-piece golf ball having a three layer structure including a core, an intermediate layer, and a cover. However, Higuchi *et al.*, as the Examiner recognizes, fails to teach or suggest a mantle and a solid cover having a compression ratio, of at least 0.98. More specifically, Higuchi *et al.* does not teach or suggest the required compression ratio of the mantle and the solid core because it does not teach the effects or advantages of the present invention, which are to obtain a good feel when hit with various types of clubs, including a #1 wood, #9 iron, and a putter. In one of the improvements of the golf ball of Higuchi *et al.*, the pleasant hitting feel of the golf ball is described. Though the feel of the #1 wood is tested in the examples of Higuchi *et al.*, other types of clubs such as a #9 iron and a putter are not tested. Thus, Higuchi *et al.* fails to teach or suggest a good feel when hit with various types of golf clubs



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ranging from a #1 wood, #9 iron, and putter. The golf ball disclosed in Higuchi *et al.* is more concentrated towards a specific type of club.

In addition, the golf ball disclosed in Higuchi *et al.* correspond to the Comparative Example 3 of Tables 1 and 3 of the present application. As shown in the following table (below), Higuchi *et al.* corresponds to Comparative Example 3, which is substantially different than Examples 1-4 as set forth in Tables 1 and 3 of the present application.

\*Table

		Examples (the claimed invention)				Comparative Example
		1	2	3	4	3
Claim of Higuchi	Three-piece solid golf ball	○	○	○	○	○
	Core center hardness of up to 75 degrees	63	63	63	63	62
	Core surface hardness of up to 85 degrees	72	72	73	73	71
	5 < Core surface hardness - Core center hardness < 25 (JIS-C)	9	9	10	10	9
	0 < Intermediate layer hardness - Core surface hardness < 10 (JIS-C)	-9	-22	-30	-23	1
	Cover hardness > Intermediate layer hardness	○	○	○	○	○
Intermediate layer hardness	Shore D	40	30	25	30	47
	JIS-C converted by Shore D value *	63	50	43	50	72
Cover hardness (Shore D)		63	63	63	63	63

\* Shore D = (0.76 × JIS C)-8 described in the reference of "DuPont"

As seen from the tables, Higuchi *et al.*, which corresponds to Comparative Example 3 of the present application, fails to provide a compression ratio within the claimed range. That is, the compression ratio (mantle/core) of the Comparative Example 3 is 0.91 (see Table 3 of the present application). Thus, it is expected that the compression ratio of Higuchi *et al.* is approximately 0.91, and this value is outside of the claimed range of at least 0.98. Furthermore,



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the Comparative Example 3 illustrates that both feel test of the #9 iron and putter are fair. Thus, in view of the relationships between the teachings of Higuchi *et al.* and Comparative Example 3, it can be said that the present invention has substantial advantages over the prior art. That is, the present invention which is typified by Examples 1-4 is superior compared to Comparative Example 3. In the same way, the present invention as typified by Examples 1-4 is superior over the teachings of the Higuchi *et al.*

The secondary reference, Shama, teaches a center component having a PGA compression of 40 to 90 and a mantle having a PGA compression of 40 to 90 (column 5, lines 17-25). The Examiner states that computing a compression ratio between the mantle to the core results in a ratio of at least 1.0 which overlaps the claimed range.

However, the golf ball disclosed in Shama is substantially different to the golf ball claimed in the present application. Specifically, Shama teaches a golf ball having a mantle which is made of cis-1,4 polybutadiene and natural rubber, which is different from a thermoplastic resin — the material that the mantle of the present application is made from. Shama thus fails to teach or suggest a mantle made of a material composed primarily of a thermoplastic resin as expressly required by the claims of the present application.

In addition, regarding the disclosed compression (PGA) of Shama, PGA signifies a force (kgf) needed for the deflection of 0.1 inch, which is different from the present invention. According to the present invention, compression is the amount of deformation when subjected to a load of 1,275 N from an initial load of 98 N. The PGA compression seems to be the reverse idea to the claimed compression. When the diameters of the ball is the same, the PGA values of the balls can be compared to each other. But, when the diameters of the balls are different from each other, the PGA values of the balls cannot be compared to each other. In Shama, when the PGA of the center is 50 and the PGA of the core (center & mantle) is 50, the PGA ratio (PGA of mantle)/(PGA of core) is 1.0. However, because of the difference between the PGA compression and the claimed compression which signifies the amount of deformation when



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subjected to a load of 1,275 N from an initial load of 98N, the PGA ratio (PGA of mantle)/(PGA of core) of 1.0 is not linked to the claimed compression ratio of 1.0. Also, as described above, since there is a difference of the material of the mantle between the claimed invention and Shama, the difference influences the hardness of the both mantles so that the compression ratio of the claimed invention would be different from that of Shama.

In all cases, one of ordinary skill in the art would not glean from the teachings of Shama (or Higuchi *et al.*) to expect the required compression ratio of at least 0.98 from the disclosed PGA values set forth in Shama. Shama further fails to teach or suggest a good feel when hit with various types of clubs such as a #1 wood, #9 iron, and a putter.

Furthermore, Applicants respectfully submit that it would not have been obvious to combine the teachings of Higuchi *et al.* with those of Shama. That is, the Examiner has selected various features from two different distinct prior art references and combined them. There is nothing to suggest or motivate one of ordinary skill in the art to combine such teachings. That is, the Examiner cannot articulate a reason why one of ordinary skill in the art would have taken a golf ball having a substantially different composition in Shama (*i.e.*, a mantle made of the same material as the core and not a thermoplastic resin) and combine that teaching with a golf ball such as that disclosed in Higuchi *et al.* Clearly, the Examiner's selection of such features and combination of these features are based on hindsight, which is impermissible under the law.

As a result, Applicants respectfully submit that even if Higuchi *et al.* and Shama taught the individual features of the present invention, that it would not have been obvious to combine the respective teachings. The Examiner cannot point to any objective evidence that would clearly motivate one of ordinary skill in the art to combine the teachings.

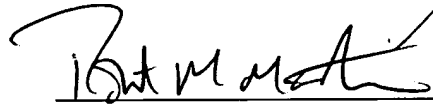
For all of these reasons, it is respectfully submitted that the present application is patentable over the art of record. It is therefore requested that the application be passed to issue at the earliest possible time. Should any other issues remain, the Examiner is respectfully requested to contact the undersigned attorney at the local telephone exchange listed below.



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Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert M. Masters", is written over a horizontal line.

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**APPENDIX**  
**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION:**

The specification is changed as follows:

Pages 3 and 4, please delete the paragraph that bridges these two pages and replace it with the following:

A vulcanizing agent such as dicumyl peroxide or a mixture of dicumyl peroxide and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane is generally included in the rubber composition. The amount of vulcanizing agent included in the rubber composition is preferably from 0.1 to 5 parts by weight per 100 parts by weight of the base rubber. ~~Advantageous~~ Advantageously, use can be use made of a commercial product such as Percumyl D (manufactured by Nippon Oils and Fats Co., Ltd.) as the dicumyl peroxide.

**IN THE CLAIMS:**

Claims 2 and 3 are canceled.

The claims are amended as follows:

1. (Amended) A solid multi-piece golf ball comprising a solid core, a mantle of at least one layer enclosing the solid core, and a cover of at least one layer enclosing the mantle, wherein the mantle is made of a material composed primarily of a thermoplastic resin, and has a thickness of up to 1.5 mm,

the mantle and the solid core have a compression ratio, defined as (compression of mantle)/(compression of solid core), of at least 0.98, the compression being the amount of deformation when subjected to a load of 1,275 N from an initial load of 98 N, and

the solid core has a surface and a center with a difference in JIS-C hardness therebetween, defined as (surface hardness - center hardness), of at least 5.



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**Claims 8-16 are added as new claims.**